RSPA-1989-12647

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RSPA/DOCKETS

June 28, 1989

Administrator
Research & Special Programs Administration
U.S. Department of Transportation
400 7th Street S.W.
Washington, D.C. 20590

RE: 49 CFR §178.65
Specification 39, Nonreusable (nonrefillable) cylinder

Dear Sir:

BernzOmatic, Division Newell Operating Company respectfully requests D.O.T. to incorporate the following revisions to Article 178.65 DOT-39 cylinders:

§178.65-7 WALL THICKNESS

a) The minimum wall thickness must be such that the wall stress at test pressure does not exceed the yield strength of the material of the finished cylinder wall. **MINIMUM WALL THICKNESS FOR FLAMMABLE GAS CYLINDERS - .028 INCH.**

§178.65-9 OPENINGS AND ATTACHMENTS

e) **ATTACHMENTS TO FLAMMABLE GAS CYLINDERS UNDER 76 IN³ VOLUME SHALL HAVE THE CYLINDER WALL NORMALIZED TO REDUCE STRESS CONCENTRATION.**

§178.65-11 PRESSURE TESTS

a) Each cylinder must be tested at an internal pressure of at least the test pressure and must be held at that pressure for at least 30 seconds.
   (1) The leakage test must be conducted by submersion under water or by some other method that will be equally sensitive.
   (2) If the cylinder leaks, evidences visual distortion, or any other defect, while under test, it must be rejected (see §178.65-13).

b) One cylinder taken from the beginning of each lot, and one from each 1,000 or less successively produced within the lot thereafter, must be hydrostatically tested to destruction. The entire lot must be rejected if (see §178.65-13):
   (1) A failure occurs at a gage pressure less than 2.0 (**3.25 FOR FLAMMABLE GAS CYLINDERS UNDER 76 IN³ VOLUME**) times the test pressure.

BernzOmatic is a leading merchandiser of disposable 14.1 oz., 16 oz., and 16.4 oz. flammable fuel gas cylinders manufactured to the DOT-39 cylinder specification. BernzOmatic's experience encompasses nearly 40 years dating back to the early 1950's. This experience has shown that the safety of the cylinder is compromised if cylinders are manufactured to standards less than those requested in this petition.

This industry (disposable fuel gas cylinder) as a whole has enjoyed an enviable safety record. We believe this safety record is directly related to the fact that most fuel gas cylinders have been manufactured in compliance with the more stringent Underwriters Laboratory Standard UL-147.

BernzOmatic in the interest of safety urges D.O.T.'s prompt consideration of this petition.

Very truly,

Roger L. Maxon

Roger L. Maxon
Director of Industrial Relations

RLM/jmb

Attachment: Minutes of May 10, 1988 ad hoc meeting on DOT-39 Fuel Gas Cylinder

DOT-39 FUEL GAS CYLINDER
COMPRESSED GAS ASSOCIATION

Meeting Tuesday, May 10, 1988
Compressed Gas Association
Cylinder Specification Committee Meeting
Williamsburg, VA, May 9-11

Attendees
Roger Maxon - BernzOmatic Div. Newell Co.
Dallas Schwalenberg - Chilton Metal Products
Richard Baumann - Chilton Metal Products
Donald Hoffman - Chilton Metal Products
Gilbert Farnham - Turner Div. Cooper Group

Purpose
The purpose of the meeting was to review the adequacies of current safety standards as they specifically relate to DOT-39 disposable cylinders having a maximum 75 cubic inch volume that are used for consumer fuel gas cylinders.

Attendee Qualifications
The attendees represented at the meeting are qualified experts of the represented companies. The attendees have combined personal experience with small consumer fuel gas cylinders of more than 110 years. They further, represent companies that each have at least 30 years experience.

Governing Regulations
CFR-49 Article 178.65 (Cylinder Specifications)
CGA Pamphlet S1.1 (Safety Relief Devices)
CGA Pamphlet C-14 (Fire Test)
CGA Pamphlet V-1
UL-STD-147 (U.L. listed products only)

The ultimate strength (minimum rupture strength) is specified as follows:

CFR-49 178.65-11 Pressure Tests
b) (1) A failure occurs at a gage pressure less than 2.0 times test pressure.

Test Pressure 178.65-2
(d) Test Pressure: The minimum test pressure is the maximum pressure of contents at 130°F or 180 psig which ever is greater.

UL-147
4.1 (1) A service pressure of not less than 250 psig if for use with propane or MPS-Gas, 2) not less than the gauge pressure of the fuel container contents at 130°F if for use with butane or butane/propane mixtures. (3) with an ultimate rupture pressure of not less than four times the service pressure.

Comparison of Specifications

Test Pressure - Pressure @ 130°F	DOT MIN	UL MIN
MPS - 235 psig	470 psig	1000 psig
Propane - 286 psig*	572 psig	1000 psig
Butane (DOT-39) 97 psig*	360 psig	388 psig
**Butane (DOT-2P) 97 psig	240 psig	

* Reference CGA Handbook
** DOT-2P limited to 31.8 In.^{3} volume

Relief Device Specifications

	CGA S-1.1	UL
Min start to discharge press.	120% test press.	144% service press.
Max start to discharge press.	80% burst press.	192% service press.
Reseat	not required	service press.

	MPS	PROPANE	BUTANE	MPS	PROPANE	BUTANE
Min start to discharge psig	282	343	116	360	360	140
Max start to discharge psig	376	458	288	480	480	186
Reseat psig	NA	NA	NA	250	250	97

Relief Device Safety factor (burst pressure/max start to discharge)

	DOT	UL
MPS	1.25	2.08
Propane	1.25	2.08
Butane	1.25	2.08

Cylinder Use Exposures

Consumer Use Factors identified.

A. Cylinders are frequently connected to and required to support heavy appliances having large moment factors.
B. Cylinders are exposed to a myriad of handling conditions and are not protected by an over pack during use by ordinary consumers.
C. Cylinders may be stored in adverse conditions for many years.

Discussions

Most small DOT-39 cylinders used for fuel gases are manufactured in compliance with the U.L. Standards. All attendees indicated personal experience with cylinders manufactured to meet parameters between those allowed by DOT-39 and those required by U.L. All attendees indicated that their experience lead their respective companies to opt for the higher safety standards for their flammable gas consumer products. The failure of a consumer flammable gas cylinder could under certain conditions inflict severe burn injuries upon a user.

The DOT standard is intended for safe transportation (shipment) of cylinders. The DOT standard requires that the cylinder be shipped in a strong over pack. Since the DOT-39 cylinder is by specification a nonrefillable cylinder, the jurisdiction of the DOT specification primary concerns a new cylinder subjected to transportation by a commercial transporter. Most of the attendees agreed that the DOT specification adequately addresses the minimum requirements for safe transportation of new fuel gas cylinders. The attendees, however, were of the opinion that the DOT standard was not adequate when used as a standard governing the use by consumers of small fuel gas cylinders.

The attendees suggested that the DOT-39 specification be revised for flammable gas cylinders having a maximum 75 $In.^3$ volume as follows:

1) Minimum wall specification - .028 inch
2) Minimum burst specification - 3.25 test pressure
3) Require material to be normalized to eliminate stress risers.

The attendees are considering the following next steps:

1) Open under CGA a docket to review the considerations with possibly a CGA pamphlet.
2) Petition DOT to review CFR-49 178.65 to incorporate additional requirements for flammable gas fuel cylinders having maximum 75 $In.^3$ volume.

RLM/jmb